*IN THE UNITED STATES PATENT AND TRADEMARK OFFICE*

In re application of: Winga HO

Application No.: 09/587,721

Filed: June 5, 2000

Title: SYNCHRONIZATION METHOD AND SYSTEM FOR KEEPING TRACK OF ENCODING HISTORY TO MAINTAIN DIGITAL SYSTEM SYNCHRONIZATION DURING COMMUNICATION OVER LOSSY TRANSMISSION MEDIA

Attorney Docket No.: MITEP010/P1101US0

Examiner: Boutah, Alina

Group: 2143

Confirmation No.: 7907



CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on March 30, 2006 in an envelope addressed to the Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450.

Signed: Kristina Gomez

Kristina Gomez

## RESPONSE TO NOTICE TO FILE CORRECTED APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



Sir:

Enclosed herewith is a Substitute Appeal Brief in response to the Notification of Non-Compliant Appeal Brief mailed March 9, 2006. Please file this document in the subject application.

The Commissioner is authorized to charge any additional fees that may be due to our Deposit Account No. 500388 (Order No. MITEP010).

Respectfully submitted,
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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

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Ex Parte Winga Ho

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**Application for Patent**

**Filed** June 5, 2000

**Serial No.** 09/587,721

**Group Art Unit** 2143

**Examiner** Boutah, A.

**FOR:**

SYNCHRONIZATION METHOD AND SYSTEM FOR KEEPING TRACK OF ENCODING HISTORY TO MAINTAIN DIGITAL SYSTEM SYNCHRONIZATION DURING COMMUNICATION OVER LOSSY TRANSMISSION MEDIA

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**APPEAL BRIEF (SUBSTITUTE)**

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Signed: _____

Kristina Gomez

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## TABLE OF AUTHORITIES

## REAL PARTY IN INTEREST

By virtue of Assignments, the real party in Interest is Mitel Networks Corporation of Kanata, Ontario.

## RELATED APPEALS AND INTERFERENCES

It is believed that there are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

## STATUS OF CLAIMS

| | |
|---|---|
| Allowed claims: | None |
| Claims objected to: | None |
| Claims rejected: | 1 to 20 |

## STATUS OF AMENDMENTS

On June 23, 2003, the Examiner issued an Official Action rejecting claims 1 to 11 under 35 U.S.C. §103(a) as being unpatentable over International PCT Application No. WO 95/14971 to Desnoyers et al. in view of European Patent No. 0851624 to Uota et al.

On September 18, 2003, Applicant responded to the Official Action by way of a Response and Amendment that amended claims 1 to 6, 9 and 11 and added new claims 12 to 20 to overcome the Examiner's rejection.

On December 12, 2003, the Examiner issued a Final Official Action rejecting claims 1 to 20 under 35 U.S.C. §103(a) as being unpatentable over the previously cited Desnoyers et al. and Uota et al. references.

## CLAIMS ON APPEAL

The claims on appeal are reproduced below in the Claim Appendix, as required by 37 CFR § 1.192(c)(7).

## SUMMARY OF CLAIMED SUBJECT MATTER

According to one aspect of the Applicant's invention as defined by independent claim 1, Applicant provides a method for transmitting encoded data between synchronized sending and receiving digital systems across a lossy transmission media. The sending and receiving digital systems maintain respective encoder and decoder information records (see page 4, lines 19, 20, 25 and 26). During the method, packet data to be transmitted by the sending digital system is encoded using encoding information in an encoder information record that has been previously acknowledged by the receiving digital system. A new encoder information record including the encoding information used to encode the packet data as well as the packet data is built (see page 6, lines 1 to 8). The encoded packet data is transmitted to the receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data (see page 6, lines 8 to 10). When the packet is received by the receiving digital system, the header is examined to determine the encoding information used to encode the packet data (see page 6, lines 15 to 19). The packet is decoded using corresponding decoder information in the decoder information record and the decoder information in the decoder information record is updated with the packet data (see page 6, lines 20 to 28). Processing of the packet is acknowledged to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode future packet data to be transmitted (see page 6, line 28 to page 7, line 2). When a packet is lost, the sending digital system rebuilds the new encoder information record without the lost packet data (see page 9, lines 7 to 16).

According to another aspect of the Applicant's invention as defined by independent claim 17, Applicant provides a communication system including synchronized sending and receiving digital systems transmitting encoded data across a lossy transmission medium. The sending and receiving digital systems maintain respective encoder and decoder information records (see page 4, lines 19, 20, 25 and 26). The communication system comprises at the sending digital system, an encoder for encoding packet data to be transmitted using encoding information in an encoder information record that has been previously acknowledged by the receiving digital system. An encoder information record construct builds a new encoder information record including the encoding information used to encode the packet data as well as the packet data (see page 6, lines 1 to 8). A transmitter transmits the encoded packet data to the receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data (see page 6, lines 8 to 10). At the receiving digital system, a header destruct examines the header to determine the encoding information used to encode the packet data (see page 6, lines 15 to 19). A decoder decodes the packet using corresponding decoder information in the decoder information record and updates the decoder information in the decoder information record with the packet data (see page 6, lines 20 to 28). An acknowledger acknowledges processing of the packet to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode packet data (see page 6, line 28 to page 7, line 2). When a packet is lost, the encoder information record construct is conditioned to rebuild the new encoder information record without the lost packet data (see page 9, lines 7 to 16).

The present invention provides advantages in that if data packets are lost, the encoder of the sending digital system is conditioned to rebuild the unacknowledged encoder history/state information record without the missing packet data. Encoding can continue using the current or previously acknowledged encoder history/state information records. Thus, encoding history is used to the extent possibly even when packets are lost reducing the amount of vocabulary the encoding algorithm must relearn (see page 2, line 30 to page 3, line 4). When the sending and receiving digital systems become unsynchronized, the encoder history/state information is conditioned to the last known point at which the digital systems were known to be synchronized and not to its initial state as is common in prior art systems. This allows

synchronization between the sending and receiving digital systems to be less tightly coupled. In this manner, encoding efficiency can be maintained since prior encoder history/state information is not lost. As a result, compressibility need not be reduced significantly when packet loss is detected and retransmission of lost data is required. This is particularly attractive when transmitting packetized data over unreliable networks such as the Internet and Frame Relay and IP networks (see page 9, lines 17 to 26).

## GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented on appeal are:

A. On the basis of prior art, the Examiner has rejected claims 1 to 20 under 35 U.S.C. §103(a) as being unpatentable over International PCT Application No. WO 95/14971 to Desnoyers et al. ("Desnoyers") in view of European Patent Application No. 0851624 to Uota et al. ("Uota"). Accordingly, the primary issue before the Honorable Board of Appeals is whether the Examiner's rejection of the present invention, as defined by claims 1 to 20 of the present application, in view of the cited references is appropriate.

## GROUPING OF CLAIMS

For the purposes of this Appeal only, Applicants accept, without prejudice, the presumption that claims 1 to 16 stand or fall together and that claims 17 to 20 stand or fall together.

## ARGUMENT

### I. Claim 1

Before dealing with the prior art rejections raised by the Examiner in the Final Official Action, Applicant would like to discuss briefly the present invention for the benefit of the Honorable Board of Appeals.

According to one aspect of the Applicant's invention as defined by independent claim 1, Applicant provides a method for transmitting encoded data between synchronized sending and receiving digital systems across a lossy transmission media. The sending and receiving digital systems maintain respective encoder and decoder information records. During the method, packet data to be transmitted by the sending digital system is encoded using encoding information in an encoder information record that has been previously acknowledged by the receiving digital system. A new encoder information record including the encoding information used to encode the packet data as well as the packet data is built. The encoded packet data is transmitted to the receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data. When the packet is received by the receiving digital system, the header is examined to determine the encoding information used to encode the packet data. The packet is decoded using corresponding decoder information in the decoder information record and the decoder information in the decoder information record is updated with the packet data. Processing of the packet is acknowledged to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode future packet data to be transmitted. When a packet is lost, the sending digital system rebuilds the new encoder information record without the lost packet data.

In contrast, Desnoyers discloses a method and system for synchronizing an encoder and a decoder for data utilizing sequence indicators and error detection information added to the data before transmission. During the method, error detection information, based on a current unit of encoded data and at least one previous unit of encoded data, is added to the encoded data to provide error detect units. The error

detect units are transmitted across the communication network. When the error detect units are received, errors are detected utilizing the error detection information therein. In order to synchronize the encoder and decoder, upon detecting an error by the decoder, the decoder transmits a reset request code sequence over a reverse channel to the encoder. In the preferred embodiment, the encoder in turn transmits an acknowledgement code sequence over the communication network to acknowledge receipt of the reset request code sequence. When the acknowledgement code sequence is received, the decoder is reset. Where there is a failure of the acknowledgement code sequence, the decoder transmits a further reset request code sequence to the encoder.

Uota discloses a method of constructing data frames to enable sending and receiving systems to determine when a transmitted data frame has not being properly received. Each data frame includes a flag sequence field, a forward information field, a backward information field, a user data field and an error-detection code field. The flag sequence field delineates the frame, the forward information field identifies the frame being sent and the backward information field includes history information of received frames in the form of an 8-bit string. When a frame is received, a bit in the bit string of the backward information field of a return frame to be transmitted is inverted. This enables the digital system receiving the return frame to determine that the previously transmitted frame was properly received.

Applicant respectfully submits that neither Desnoyers nor Uota either alone or in combination teaches or suggest the Applicant's invention as claimed. The Examiner acknowledges that Desnoyers fails to teach or suggest building a new encoder information record including the encoding information used to encode the packet data as well as the packet data; updating the decoder information in the decoder information record with the packet data; acknowledging processing of the packet to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode packet data; and at the sending digital system rebuilding the new encoder information record without the lost packet data.

The Examiner alleges that Uota teaches building a new information record including the information used to construct the packet data as well as the packet data; updating the information in the receiver information record with the packet data; acknowledging processing of the packet to the sending digital system to enable the

sending digital system to update the encoder information so that the new encoder information record is used to send packet data; and when the packet is lost, at the sending digital system rebuilding the new encoder information record without the lost packet data. Contrary to the Examiner's statements concerning Uota, Applicant respectfully submits that Uota fails to teach or suggest the building or rebuilding of an information record used to encode packet data. Uota simply discloses the construction of data frames that can be examined to determine if previously transmitted frames were received by adjusting bits in the bit strings of backward information fields within return data frames. Thus, Applicant respectfully submits that Desnoyers and Uota do not result in the Applicant's invention as claimed.

Applicant also respectfully submits that there is no possibility of combining the cited references without the benefit of hindsight analyses to arrive at the Applicant's invention as claimed. The Supreme Court has frequently warned against the use of "hindsight" in determining obviousness (see for example Diamond Rubber Co. v. Consolidated Rubber Tire Co., 220 U.S. 428 (1911)). In re Mahurkar Patent Litigation (1993), 831 F. Supp. 1354, 28 U.S. PQ 2d 180 (N.D. ILL. 1993.), Judge Easterbrook noted that "decomposing an invention into its constituent elements, finding each element in the prior art, and then claiming that it is easy to reassemble these elements into the invention, is a forbidden ex post analysis".

The Examiner is clearly using the present invention, as claimed, as a template in order to piece together the teachings of the prior art to render the claims obvious. It is impermissible to use the disclosure of the present invention as a "road map" for selecting and combining prior art disclosures. As stated in In re Wesslau, 353 F. 2d 238, 147 U.S. PQ 391 (CCPA 1965), the Court of Customs and Patent Appeals cautioned that "it is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art".

The primary Desnoyers reference relied upon by the Examiner fails to teach or suggest a significant amount of the subject matter recited in independent claim 1. The Examiner has expanded the teachings of Uota to allege that the subject matter missing from Desnoyers is shown in Uota and that one of ordinary skill in the art would combine Desnoyers and Uota to arrive at the Applicant's invention as claimed. Applicant respectfully disagrees. Desnoyers teaches an encoder and decoder

synchronization technique utilizing sequence indicators and error detection information added to the data before transmission wherein the decoder is reset in response to an acknowledgement code sequence received from the encoder that is generated when the decoder transmits a reset request code sequence. To allege that one of ordinary skill in the art would modify the teachings of Desnoyers in view of Uota clearly disregards the teachings of Desnoyers as a whole, which presents its own synchronization technique based on sequence indicators, error detection information and reset request code sequences. Accordingly, Applicant respectfully submits that the Examiner's combination of references is inappropriate and contrary to well established law.

## II. Claim 17

According to another aspect of the Applicant's invention as defined by independent claim 17, Applicant provides a communication system including synchronized sending and receiving digital systems transmitting encoded data across a lossy transmission medium. The sending and receiving digital systems maintain respective encoder and decoder information records. The communication system comprises at the sending digital system, an encoder for encoding packet data to be transmitted using encoding information in an encoder information record that has been previously acknowledged by the receiving digital system. An encoder information record construct builds a new encoder information record including the encoding information used to encode the packet data as well as the packet data. A transmitter transmits the encoded packet data to the receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data. At the receiving digital system, a header destruct examines the header to determine the encoding information used to encode the packet data. A decoder decodes the packet using corresponding decoder information in the decoder information record and updates the decoder information in the decoder information record with the packet data. An acknowledger acknowledges processing of the packet to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode packet data. When a packet is lost, the encoder information record

construct is conditioned to rebuild the new encoder information record without the lost packet data.

As will be appreciated, independent claim 17 relates to a communication system that carries out communications in a manner similar to that defined by independent claim 1. Accordingly, Applicant's commentary provided above concerning the patentability of independent claim 1 over the cited Desnoyers and Uota references, equally applies to independent claim 17.

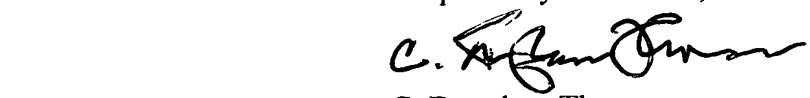
In view of the above, Applicants respectfully submit that the present application is in order for allowance and respectfully request the Board of Appeals to direct the Examiner to withdraw the Final Official Action and issue a Notice of Allowance.

It is submitted that the rejection of claims 1-20 under 35 U.S.C. §103 is improper and should be withdrawn. Accordingly, it is respectfully requested that the Board reverse the Examiner's rejection and remand the application to the Examiner with directions to allow all claims.

## CONCLUSION

In view of the foregoing, it is respectfully submitted that the Examiner's rejection of claims 1-20 as being unpatentable over PCT Publication No. WO/14971 to Desnoyers et al. in view of European Patent No. 0851624 to Uota et al. is erroneous. Accordingly, the rejection of claims 1-20 under 35 U.S.C. §103 should be reversed. For the reasons set forth in this Appeal Brief, the Board should reverse the final rejection and should order the Examiner to pass this application to allowance.

Respectfully Submitted,



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## CLAIM APPENDIX

1. A method for transmitting encoded data between synchronized sending and receiving digital systems across a lossy transmission media, said sending and receiving digital systems maintaining respective encoder and decoder information records, said method comprising the steps of:

encoding packet data to be transmitted by said sending digital system using encoding information in an encoder information record that has been previously acknowledged by said receiving digital system;

building a new encoder information record including the encoding information used to encode said packet data as well as the packet data;

transmitting the encoded packet data to said receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data;

when the packet is received by said receiving digital system, examining the header to determine the encoding information used to encode said packet data;

decoding the packet using corresponding decoder information in said decoder information record and updating the decoder information in said decoder information record with said packet data;

acknowledging processing of the packet to said sending digital system to enable said sending digital system to update said encoder information so that said new encoder information record is used to encode future packet data to be transmitted; and

when the packet is lost, at the sending digital system rebuilding the new encoder information record without the lost packet data.

2. The method of claim 1 wherein said rebuilding step is performed when a packet is received out of sequence by said receiving digital system and a threshold amount of time elapses without the missing packet being received.

3. The method of claim 2 wherein packets received out of sequence are stored in a queue and wherein a packet timer is initiated by said receiving digital

system to count said threshold amount of time when a packet is received out of sequence, said packet timer being stopped when said missing packet is received.

4. The method of claim 3 wherein said rebuilding step includes the step of sending a synch control packet from said receiving digital systems to said sending digital system, said synch control packet including a tag identifying the last packet processed by said receiving digital system, said sending digital system using said synch control packet to rebuild said new encoder information record.

5. The method of claim 4 wherein said rebuilding step further includes the steps of initiating a synchronization timer at said receiving digital system when said synch control packet is sent; stopping said timer when an acknowledgment is received from said sending digital system in response to said synch control packet; and resending the synch control packet and reinitiating the synchronization timer if said synchronization timer expires and an acknowledgment has not been received.

6. The method of claim 5 wherein said rebuilding step further includes the steps of incrementing a counter each time a synch control packet is sent; comparing the value of said counter to determine if the value equals a threshold prior to resending the synch control packet and reinitiating the synchronization timer; and resetting the communication link between said sending and receiving digital systems if the value of said counter equals said threshold value.

7. The method of claim 1 wherein during said acknowledging step, an acknowledgment packet is returned to said sending digital system, said acknowledgment packet including identifying the last packet processed by said receiving digital system.

8. The method of claim 1 wherein during said acknowledging step, an acknowledgment header encapsulating data packets is returned to said sending digital system, said acknowledgment header identifying the last packet processed by said receiving digital system.

9. The method of claim 1 further comprising the steps of, prior to decoding said packets by said receiving digital system, examining said packets to detect corrupted packets and discarding corrupted packets.

10. The method of claim 9 wherein during said examining step a cyclic redundancy check is performed on said packets.

11. The method of claim 10 further comprising the step of discarding received packets having packet numbers outside of a defined range of expected packet numbers.

12. The method of claim 6 further comprising the steps of, prior to decoding said packets by said receiving digital system, examining said packets to detect corrupted packets and discarding corrupted packets.

13. The method of claim 12 wherein during said examining step a cyclic redundancy check is performed on said packets.

14. The method of claim 13 further comprising the step of discarding received packets having packet numbers outside of a defined range of expected packet numbers.

15. The method of claim 1 wherein during encoding, the packet data is compressed, encrypted and/or scrambled.

16. The method of claim 9 wherein during encoding, the packet data is compressed, encrypted and/or scrambled.

17. A communication system including synchronized sending and receiving digital systems transmitting encoded data across a lossy transmission medium, said sending and receiving digital systems maintaining respective encoder and decoder information records, said communication system comprising:

at the sending digital system, an encoder for encoding packet data to be transmitted using encoding information in an encoder information record that has been previously acknowledged by said receiving digital system;

an encoder information record construct for building a new encoder information record including the encoding information used to encode said packet data as well as the packet data; and

a transmitter for transmitting the encoded packet data to the receiving digital system as a packet including a header having a packet number and a tag identifying the encoding information used to encode the packet data; and

at the receiving digital system, a header destruct for examining the header to determine the encoding information used to encode said packet data;

a decoder for decoding the packet using corresponding decoder information in said decoder information record and updating the decoder information in the decoder information record with the packet data; and

an acknowledger for acknowledging processing of the packet to the sending digital system to enable the sending digital system to update the encoder information so that the new encoder information record is used to encode packet data, wherein when a packet is lost, said encoder information record construct is conditioned to rebuild the new encoder information record without the lost packet data.

18. A communication system according to claim 17 wherein said encoder information construct is conditioned to rebuild the new encoder information record when a packet is received by said receiving digital system out of sequence and a threshold amount of time elapses without the missing packet being received by the receiving digital system.

19. A communication system according to claim 18 wherein said receiving digital system stores packets received out of sequence in a queue and initiates a packet timer to count said threshold amount of time when a packet is received out of sequence, said packet timer being stopped when said missing packet is received.

20. A communication system according to claim 19 wherein said receiving digital system sends a synch control packet to said sending digital system when a

packet is lost, said encoder information record construct being responsive to said synch control packet to rebuild the new encoder information record, said synch control packet including a tag identifying the last packet processed by said receiving digital system.

## EVIDENCE APPENDIX

None.

## RELATED PROCEEDINGS APPENDIX

None.